



Cities Feeding People Project Fact Sheets

by
Pascale Dennery
1995



Cities Feeding People Series
Report 15

The International Development Research Centre
Le Centre de recherches pour le développement international
El Centro Internacional de Investigaciones para el Desarrollo

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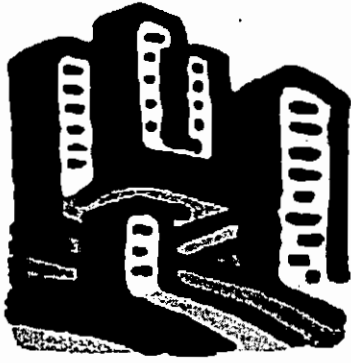
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“Cities Feeding People” Program Reports

“Initiative Agriculture urbaine” Rapports de recherche

1. **Urban Agriculture Research in East and Central Africa: Record, Capacities and Opportunities** by Camillus J. Sawio, University of Dar es Salaam (1993).
2. **Urban Agriculture Research in East Africa: Record, Capacities and Opportunities** by Davinder Lamba, Mazingira Institute (1993).
3. **Urban Agriculture Research in East & Southern Africa I: Record, Capacities and Opportunities** by Kadmiel H. Wekwete, University of Zimbabwe (1993).
4. **Urban Agriculture Research in East & Southern Africa II: Record, Capacities and Opportunities** by Admos Chimbowu and Davison Gumbo, ENDA-Zimbabwe (1993).
5. **Urban Agriculture Research in West Africa: Record, Capacities and Opportunities** by Souleymane Diallo, ENDA-Tiers Monde, Dakar (1993).
6. **Urban Agriculture Research in East & Southeast Asia: Record, Capacities and Opportunities** by Yue-man Yeung, The Chinese University of Hong Kong (1993).
7. **Urban Agriculture Research in Latin America: Record, Capacities and Opportunities** by Julio Prudencio Bohrt, UNITAS (1993).
8. **Urban Food Production: Evolution, Official Support and Significance** by Luc J.A. Mougeot, IDRC (1994).
9. **Promoting Urban Agriculture: A Strategy Framework for Planners in North America, Europe and Asia** by Paul Sommers and Jac Smit, The Urban Agriculture Network (1994).
10. **Urban Agriculture and the Sustainable Dar es Salaam Project, Tanzania** by Camillus J. Sawio, UNCHS-IDRC Project Coordinator (1994).

11. **Une histoire de deux villes: Comparing Canadian Community Gardening Programs in Montreal and Toronto** *by* Sean Cosgrove, Toronto Food Policy Council (1994).
12. **Urban Agriculture: Can Planners Make a Difference?** *by* Timothy Greenhow, SWEDEPLAN/Swedish National Board of Housing, Building and Planning (1994).
13. **Agricultura urbana en América Latina: evaluación in situ para iniciativa regional** *por* Julio Prudencio Bohrt, consultor del CIID (1994).
14. **L'agriculture urbaine en Afrique tropicale: évaluation in situ pour initiative régionale** *par* Kando Golhor, consultant du CRDI (1995).
15. **Cities Feeding People Project Fact Sheets** *by* Pascale Dennery, IDRC Intern (1995).
16. **Urban Agriculture in Canada: A Survey of Municipal Initiatives in Canada and Abroad** *by* Michel Frojmovic, IDRC Consultant (1996).
17. **The Third Meeting of the Support Group on Urban Agriculture (SGUA): Proceedings, March 18 - 19, 1996** *by* IDRC and the Urban Agriculture Network (TUAN) (1996).
18. **Urban Agriculture, Progress and Prospect: 1975 - 2005** *by* Jac Smit, The Urban Agriculture Network (TUAN) (1996).
19. **Urban Agriculture: A Survey of Academic Expertise and Programs in Canada** *by* Rita Lindayati, IDRC Intern (1996).
20. **Managing Urban Agriculture in Dar es Salaam** *by* Camillus J. Sawio, University of Dar es Salaam (1998).
21. **Gender Capacity in Urban Agriculture: Case Studies from Zimbabwe, Uganda, and Ghana** *by* Kaneez Hasna, IDRC Intern (1998).
22. **CFP Program Initiative Program Summary (1997 - 2000)** *by* IDRC (1998).
23. **Farming in the Shadow of the City: Changes in Land Rights and Livelihoods in Peri-Urban Accra** *by* Daniel Maxwell (International Food Policy Research Institute, USA), Wordsworth Odame Larbi (Lands Commission, Ghana), and Grace Mary Lamptey, Sawudatu Zakariah, and Margaret Armar-Klemesu (University of Ghana, Ghana) (1998).
24. **Peri-Urban Livestock Production Systems** *by* O.B. Smith (IDRC, Senegal) and E.A. Olaloku (International Livestock Research Institute, Ethiopia) (1998).

25. **Urban Agriculture in Canada: Capacities and Experiences of Canadian NGO's**
by LifeCycles, British Columbia (in progress, 1998).
26. **Gender Resources for Urban Agriculture Research** *by* Alice Hovorka, IDRC Intern (1998).

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Pour obtenir gratuitement les rapports ci-haut, prière de s'adresser à Brenda Lee Wilson, Initiative Agriculture urbaine, Direction générale des programmes, CRDI, BP 8500, Ottawa, Ontario, K1G 3H9, par courrier électronique: BLWilson@idrc.ca ou par l'Internet: <http://www.idrc.ca/cfp/reports>

FOREWORD

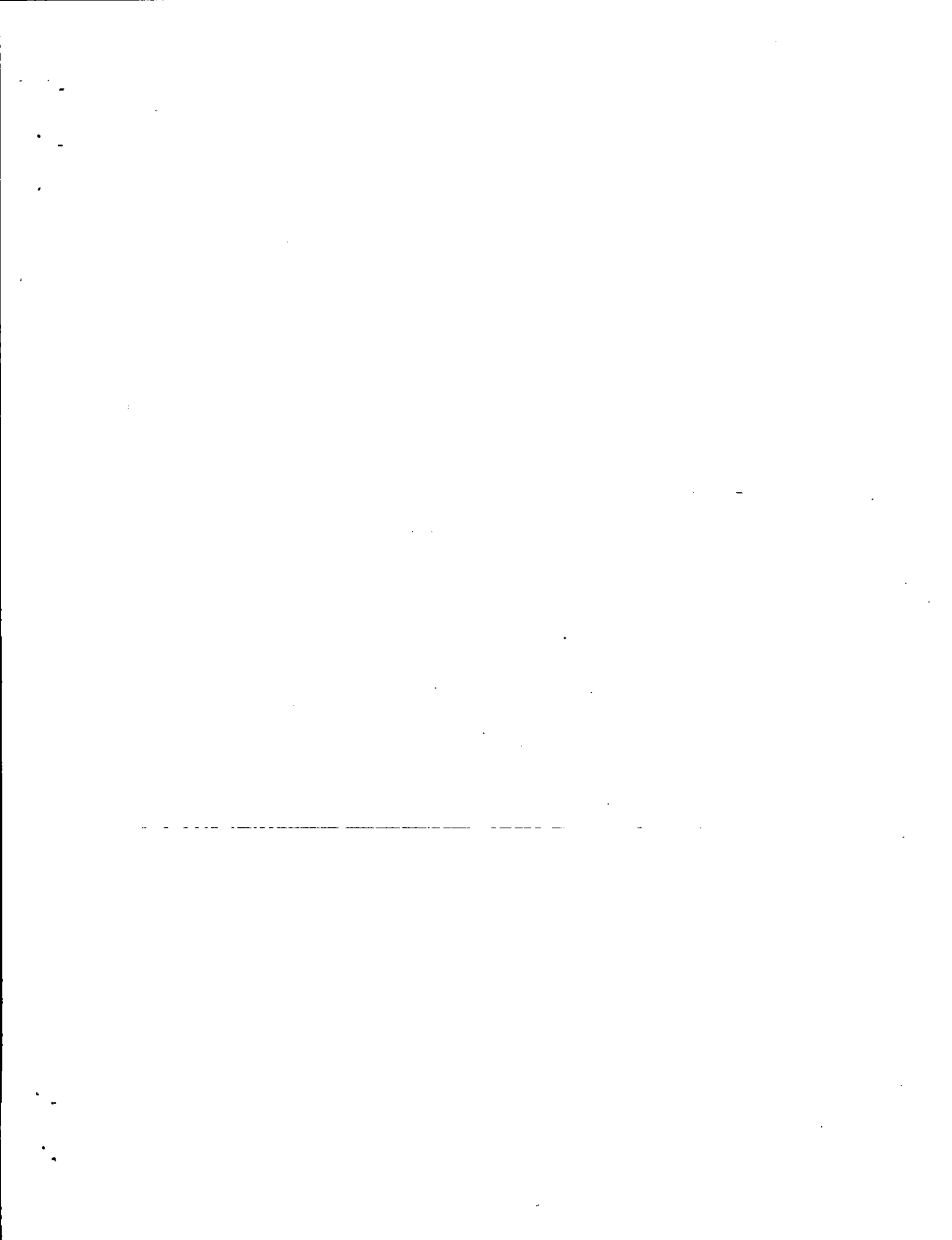
The Cities Feeding People Program is pleased to present this package of 22 fact sheets. Each fact sheet briefly describes an IDRC funded project from one of the following areas:

- urban food production and processing
- reuse of urban waste
- urban nutrition and food security
- research support activity

The 22 projects were selected from a list of over 50 urban-related projects. The fact sheets for on-going research projects will be updated once more information is available and new fact sheets may be added from time to time.

We hope that you will find the fact sheets informative and that they will contribute to your understanding of IDRC's past and current support to research on urban food systems. Questions or comments should be directed to Dr. Luc Mougeot, Senior Program Officer, Cities Feeding People Program, Research Programs Branch, IDRC, Ottawa, Canada.

Ms. Pascale Dennery, B.Sc. (Agr.), M. Sc.





CITIES FEEDING PEOPLE PROJECT FACT SHEET 1

International Development Research Centre

Project title: Urban Agriculture in Dar es Salaam (TANZANIA)
Project category: Urban Food Production & Processing

Research institution: University of Dar es Salaam
IDRC contribution: \$ 250 000 CAD
Other donors: UNCHS and GTZ

Total cost: \$ 500 000 CAD
Centre file no.: 93-0037
Duration: 2 years (in progress)

Purpose: This project is part of a new series of policy-oriented projects on urban agriculture in East Africa. It was designed to influence urban environmental policy for Dar es Salaam. The project is part of the broader Sustainable Dar es Salaam Project.

Objectives: Research will provide information on the economic importance of urban agriculture and on the interaction between urban agriculture and the urban environment. The means and opportunities for policy intervention and for project implementation will be identified.

Project findings: The expected results include: the elaboration of strategies which support urban agricultural activities and which sensitize government officials to the role of these activities; the creation of an information base to assist in the management of open spaces, recreational areas, and hazard lands; the identification of current problems related to the economic and health aspects of urban agriculture; the preparation of action plans to be implemented in conjunction with the Sustainable Dar es Salaam Project; and the publication of a manual documenting and evaluating this research experience and of several research papers. In addition to these results, the project should also strengthen local expertise and contribute to the research capacity of local institutions in the field of urban agriculture and in its interaction with the urban environment.

By August 1994, the project staff had held a one day workshop on urban agriculture in Dar es Salaam, had a panel discussion with Radio Tanzania and ITV, and had raised key issues with the Sustainable Dar es Salaam Project's working-group coordinators. Five research sites had been selected, in and near the city, based on the following criteria: rate of expansion and level of infrastructure, planned or unplanned site, income level, waste generation and management, air and groundwater pollution, availability of unbuilt space, relationship with coastal resources and tourism, and informal and formal economic activity. Part of the study involves linking urban agriculture with on-going research activities in East Africa to avoid duplication. Therefore, the possibility of collaborating with experts from the Natural Resource Institute (U.K.), who were starting a pilot project on small-scale horticulture and waste recycling, was under investigation. GTZ data on urban horticulture, open areas within built-up areas, and the practices of low-income groups was also quite useful for the project.

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Project literature:

Camillus J. Sawio. 1994. Urban Agriculture and the Sustainable Dar es Salaam Project. Cities Feeding People Series Report 10, IDRC.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 2

International Development Research Centre

Project title: Urban Agriculture in Harare (ZIMBABWE)
Project category: Urban Food Production & Processing

Research institution: ENDA Zimbabwe
IDRC grant: \$ 18 000 CAD

Centre file no.: 93-0024
Duration: 3 months

Purpose: This small project provided the necessary tools for formulating an integrated approach to policy and planning for open-space urban agriculture in Harare. It was the preliminary phase for a future, larger initiative.

Objectives: The overall objective was to provide an understanding of the structure and dynamics of open-space urban agriculture in Harare. Specific objectives were as follows: to produce a map of open-space urban agricultural land use; to characterize agricultural producers in terms of location of residence (density of settlement), income, occupation, and farming system used; to estimate the value of produce consumed and sold; to inform the relevant institutions with regards to their potential role and involvement in supporting and managing urban agriculture; and to hold a one day workshop to present and discuss the study results.

Project findings: The growth of open-space urban agriculture in Harare between 1990 and 1994 was particularly striking: the total surface area being used for agriculture has almost doubled and is now 9 300 ha (16.7%). Most of this growth is the result of an expansion in off-plot food production and in cultivation on marginal land. The causes of this expansion can be attributed in part to the removal of subsidies for basic foods and to a general rise in the cost of living stemming from the introduction of a structural adjustment program. The productive potential of urban agriculture is high and there is a wide range of benefits (food, income, cash-savings, employment). However, there are some concerns such as potential pollution from the use of pesticide, noise and nuisance of animals, health hazards from contaminated produce, lack of water and shortage of land available for cropping. Growing crops and raising animals is most popular with residents of high density areas. While cultivation tends to be off-plot, animal raising tends to be on-plot. The majority of producers are women and are unemployed.

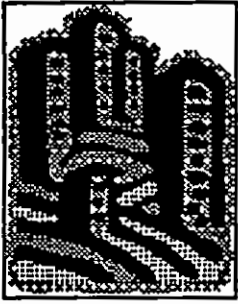
Project recommendations: There is a need for central and local government to adopt enabling legislation to make urban agriculture an integral part of land use in Harare. Awareness raising and training for policy-makers and planners is needed to define their roles and foster effective change. A management framework must be elaborated to ensure the long-term sustainability of urban agriculture which includes tenure arrangements, extension services, and access to credit.

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Project literature:

ENDA-Zimbabwe. 1994. Urban Agriculture in Harare. Environment Development Activities-Zimbabwe.

Environment Resource Management Division, ENDA-Zimbabwe. 1994. Proceedings of the Workshop on Urban Agriculture: Experiences in Harare - Presentation of Preliminary Results and Way Forward.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 3

International Development Research Centre

Project title: Farming in the City (Kampala, UGANDA)
Project category: Urban Food Production & Processing

Research institution: Makerere Institute of Social Research
IDRC grant: \$ 2 500 CAD

Centre file no.: 93-4104-04
Duration: 1 month

Purpose: A one day seminar was organized to present the findings of recent research on food production in Kampala and raise related policy issues. Topics covered by the research included urban household economic strategies, land access, and the impact of urban agriculture on food security and nutrition.

Objectives: The seminar served to report on the above research, to discuss the implications of the study for the understanding of urban agriculture and of how existing policies affect it, to obtain feedback and alternative analyses on the data collected, to identify what further information is needed for policy formulation and what further research is needed, and to assess researcher interest in urban agriculture.

Project findings: About 100 persons attended the seminar. Among the participants there were various members of the research community, policy makers from both Kampala City Council and a number of government ministries, the Chairman of the City Council and several council members, other local politicians, representatives from NGOs and international organizations, and several study respondents and participants. During the seminar, comments were made on the study methods, the conceptualization of the study and the interpretation of the results, the policy implications, and the recommendations for further research. An interesting argument arose regarding whether urban agriculture is a household strategy or a strategy of individuals within the household. The issue of why the majority of urban farmers were women was also raised. Study data indicates that women have little spare time and that men and women have similar levels of education. Therefore women engage in farming because they are responsible for feeding the household not because they have nothing else to do with their time.

Project recommendations: There was a general consensus that, in spite of certain problems, urban agriculture should be promoted and regulated, not banned. Once urban agriculture is considered legal, then the key issue becomes access to land and the nature of land use agreements. Land within the city must be set aside for food production. Further attention could also be given to micro-livestock production. The environmental impact of urban farming is an critical area for further research. Other suggestions were the potential for intensive urban production of crops and animals, customary tenancy, and gender relations within urban households.

19/06/95

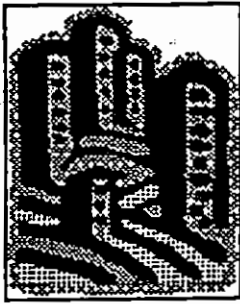
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Project literature:

Daniel G. Maxwell. 1994. The household logic of urban farming in Kampala. In Egziabher A.G., Lee-Smith D., Maxwell D.G., Memon P.A., Mougeot L.J.A., and Sawio C.J. Cities Feeding People: An Examination of Urban Agriculture in East Africa, pp.47-66. IDRC.

Daniel Maxwell and Gertrude Atukunda. In progress. Farming in the city of Kampala: Issues for urban management. African Urban Quarterly.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 4

International Development Research Centre

Project title: Solid Waste Management (Sale, MOROCCO)
Project category: Reuse of Urban Waste

Research institution: CNGSE*, Rabat
IDRC grant: \$ 150 000 CAD

Centre file no.: 92-0017
Duration: 2 years (in progress)

Purpose: Waste disposal is a major environmental concern in rapidly growing urban areas. This project was designed to test a waste management system. The system comprised of collection and treatment of household waste and was developed with community participation. A small peri-urban community near the city of Sale was used as the pilot test site though the system was designed to be adaptable to other areas.

Objectives: The project objectives were to review methods of data collection used for similar studies; to form an experimental, multidisciplinary research team; to propose a socially and financially acceptable system for the elimination of solid wastes in peri-urban areas (options such as recycling, controlled disposal, composting and anaerobic digestion were considered); to publish documents, to disseminate project results and the methods used for community education, and to raise awareness.

Project findings: The multidisciplinary team, in cooperation with the municipality, has organized two educational campaigns aimed at informing the public of the importance of protecting the environment and the deleterious aspects of improper waste disposal. The first campaign was a month long, the second one was three days long. T-shirts, caps, posters were specially made to make campaign volunteers visible and a drawing contest was organized for primary school students.

A questionnaire survey was elaborated and pre-tested. The administration of the questionnaire survey took place just after the second educational campaign and the total sample was over 200 households. Community residents were found to be embarrassed by and discontented with the presence of uncontrolled piles of waste in the area. Most residents were in favour of door to door waste collection or of the installations of large waste bins which can be wheeled to a common collection site.

*Centre national de génie sanitaire et de l'environnement

26/06/95

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Fax: 212-7-78853

Project documentation:

My A. Frouji et S. Naji. 1995. Gestion des déchets solides dans les zones suburbaines - Cas de Kariat Oulad Moussa. Rapport pour le CRDI.

CNGSE. 1994. Déchets solides - Enquête et campagne (vidéo cassette).



CITIES FEEDING PEOPLE PROJECT FACT SHEET 5
International Development Research Centre

Project title: Nutrition in Urban Slums (INDIA)
Project category: Urban Nutrition and Food Security

Research institutions: see below*
IDRC contribution: \$ 320 000 CAD
Other donor: UNICEF

Total Cost: \$ 420 000 CAD
Centre file no.: 90-0004
Duration: 3 years

Purpose: The project sought to develop strategies and interventions for nutritional improvement within existing agencies. Alternative community based strategies will be explored in this project.

Objectives: The general objective of this project was to improve the health and nutritional status of urban slum families by enhancing access to nutrition and health services and improving utilization through active community participation.

Project findings: Local investigators were selected to carry out the survey, to facilitate focus group meetings with selected informants, and to do participant observation on several households. The local investigators were supervised by a team of research assistants. There was a strong emphasis on women and their needs throughout the project.

In Indian slums, the majority of households fail to link poor sanitation and nutrition with poor health. In working with community members, it was found that intervention was most needed for children (ages 0 to 5), adolescent girls, and pregnant and lactating women. The members identified specific problems and their causes and also proposed solutions. Two areas were selected for immediate action: basic education of children and income generation, particularly for women. An interesting finding was that even though some women possess skills like tailoring, they are unable to use them because of lack of economic and social support.

In the area of environment and sanitation, the following interventions were proposed: the elaboration of a specific action plan to deal with environment and sanitation issues, awareness raising among children and youth about the importance of environmental hygiene, liaison and pooling of resources with a governmental organization, setting up basic amenities (latrines, water taps) in areas where they are not available, and the formation of a registered society to tackle issues such as the lack of toilets or blocking of drains and maintenance of new and existing amenities. Implementation of these intervention had begun in several of these areas.

*The research was done by four organizations: the SDNT Women's University (Dept. of Home Science) in Bombay, the Institute of Home Economics in Delhi, the All India Institute of Public Health and Hygiene in Calcutta, and the Child-in-Need Institute also in Calcutta.

27/06/95

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CITIES FEEDING PEOPLE PROJECT FACT SHEET 6
International Development Research Centre

Project title: Institutional Assessment for Research Network
on Urban Agriculture (LATIN AMERICA)
Project category: Research Support Activity

Consultant: J. Prudencio Bohrt
IDRC grant: \$ 25 000 CAD

Centre file no.: 93-4104-07
Duration: 50 days

Purpose: The aim of this consultancy was to assist in the formation of a regional research effort on urban agriculture in Latin America. A parallel effort was underway in East Africa. This project stems from a previous effort to review past research and identify institutions able to carry out urban agriculture research.

Objectives: The consultant circulated research network guidelines to potential institutions; visited selected cities in order to find out what work had already been done, assess local demand and expertise, investigate options for joint funding of projects, and invite suitable institutions to submit proposals for the research network; reviewed and selected proposals; and organized a workshop to define the regional proposal.

Project findings: A total of 43 institutions in 11 countries were visited and 11 project proposals were submitted. The rate at which urban agriculture is expanding in Latin American cities is not the same for each city. Cities like Cuzco and Cochabamba are more axed towards food production than cities like Buenos Aires whose urban development tends to favour industrial activity. Urban agricultural activities in Latin American cities can be classified into four main categories: gardening, hydroponic production, reuse of urban organic wastes, and other activities (reforestation, waste water treatment, small animal production, etc.). Urban agriculture is particularly popular during times of economic or political crisis.

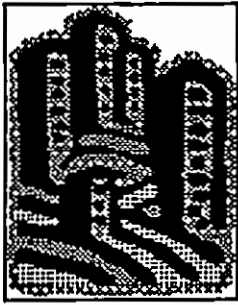
In Latin America, the principal functions of urban agriculture are supplying food and maintaining adequate nutritional status, income generation and employment. Interestingly, produce of very high quality is usually sold as this quality of produce is in great demand. There are several problems such as the competition between land for construction and land for agriculture, the marketing of urban produce which seems to be largely dependent on prices of rural produce and quantity of urban produce available, water availability and the cost and supply of inputs (especially for hydroponic production), and the temporary nature of local organizations which form around urban agricultural activities. There are also few policies for the management of urban agriculture. In many cities, agriculture is not efficient enough to be economically advantageous compared to other activities. Finally, there is a lack of coordination between municipal governments, NGOs, development organizations and research institutions, which in turns leads to poor monitoring and follow-up of activities.

28/06/95

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Project literature:

Julio Prudencio Bohrt. 1994. Agricultura urbana en América latina: evaluación in situ para iniciativa regional. Cities Feeding People Series Report 13, IDRC.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 7
International Development Research Centre

**Project title: Community Based Solid Waste Management in Slums
(Bombay, INDIA)**

Project category: Reuse of Urban Waste

Research institution: SNDT Women's University
IDRC grant: \$ 175 000 CAD

Centre file no.: 94-8307
Duration: 3 years (in progress)

Purpose: The project will design a community based solid waste management system for Gilbert Hill (the second largest slum in Bombay). Two approaches to waste management will be tested. The first is a community-based primary collection system by which residents cooperate in collecting wastes and delivering them to transfer points for collection by the municipal authority. The second is community-based primary collection with source separation and waste reduction through composting and trade in inorganic materials for recycling.

Objectives: Project activities will serve to determine people's attitudes to and perceptions of solid waste problems and their capacity to participate in various technological and organizational options; to investigate the nature and quantities of solid wastes from households, shops, enterprises, stables and other sites in Gilbert Hill and to test suitability for composting; to provide training and community education on solid waste management; to test and compare two approaches to solid waste management; and to negotiate with the Bombay Municipal Corporation for the policy changes needed to implement selected programs.

Project findings: Because there is very little research experience in India on the perceptions, motivations and behaviours of people with regard to solid waste, the project will in fact be developing methods to investigate these issues.—The links between solid wastes, drainage, sanitation, water supply and the concept of "greening" will be part of the investigation. One of the products of waste recycling, bio-organic soil enricher, can potentially be used in and around the slum for growing ornamental plants, herbs and vegetables, and other plants.

Anticipated results are that the community-based primary collection system and the community-based primary collection with source separation and waste reduction will each be suitable in different parts of the slum. The first system should result in the cooperation between residents (responsible for regular cleaning and taking wastes to collection points), the sweepers who will be paid by the residents and the municipal corporation (removing wastes and cleaning drains). Residents' committees will be created to monitor progress. The second system will separate organic waste from other waste for composting. The compost will be used for the greening of Gilbert Hill. Indirect benefits, such as improvement in health of residents, adding value to organic and inorganic waste, changes in community perspective on waste, are expected in the coming years.

30/06/95

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CITIES FEEDING PEOPLE PROJECT FACT SHEET 8

International Development Research Centre

Project title: Effect of Sewage Utilization on Fish Farming and Irrigation (Hanoi, VIETNAM)

Project category: Reuse of Urban Waste

Research institution: CRES*

IDRC grant: \$ 93 000 CAD

Centre file no.: 93-8012

Duration: 2 years (in progress)

Purpose: This project will study the environmental and health effects of untreated waste water when it is used for fish and crop production. The study will be carried out by the Centre for Natural Resources and Environmental Studies.

Objectives: The project seeks to evaluate the quality of various sources of waste water which are reused for agricultural purposes, to assess the impact of raw sewage use for fish farming and irrigation on the environment, public health, and socio-economic well-being, to suggest appropriate measures for improving food production systems while reducing the amount of hazardous substances in sewage, and to train a team of Vietnamese scientists in the analysis and management of water pollution problems.

Project findings: The field site of Thanh Tri District, a low-lying district immediately south of Hanoi has been chosen as it is there that much of the city's sewage ends up. The sewage is used for aquaculture and for the irrigation of food crops because of its high organic matter content and its nutrient content. About 70% of the waste water is from domestic sources and the remainder is from industry.

In the first seven months of research, three main activities have been completed. The first activity was the water quality survey. Samples were taken at fourteen locations along three rivers. Water and sludge samples were collected in both the rainy and the dry season. A large number of properties were tested. The second activity is a health survey. The survey was carried out in five communes within the district. Close to three thousand people were interviewed and some were given medical tests. The third activity was the examination of sewage-fed fish ponds. Eight ponds, representative of different types of water use, were selected. Water and fish samples were taken and their chemical and biological properties were looked at. An additional activity, the socio-economic assessment, has been initiated but more work is needed on land tenure and the contractual relationships which govern sewage use.

*Centre for Natural Resources and Environmental Studies

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CITIES FEEDING PEOPLE PROJECT FACT SHEET 9

International Development Research Centre

Project title: Urban Food Security (CENTRAL AMERICA)

Project category: Urban Nutrition and Food Security

Research institution: IFPRI*

IDRC grant: \$ 244 000 CAD

Centre file no.: 89-0316

Duration: 1 year

Purpose: The project brought face-to face actors involved in bottom-up and top-down planning and program formulation. These actors worked together on creating a greater awareness and understanding of the impact of policies and programs on the urban poor and their quality of life, broader policy and development issues, and grassroots level needs and priorities as well as appropriate and feasible solutions.

Objectives: The project was to develop operational paradigms as bases for strengthening the complementarity and integration of self-reliant development efforts at grassroot levels, and top-down policy formulation and development planning, particularly as these affect the food security, health and nutrition and the quality of life of the urban poor.

Project findings: The project was carried out in low-income settlements (barrios) in the capitals of three Central American countries, namely Nicaragua, Costa Rica and Honduras. The participants in the project consisted of four actor-groups: community groups, local researchers, policy makers, and program administrators. There were three levels of project activities: community-level action research, participatory workshops in each of the countries, and workshops with representatives from each of the three countries. Horizontal transfers of knowledge will be encouraged at each level. Local research teams and community groups conducted an analysis of the policies and programs for community basic needs and their relations to public sector policies and action programs. They then presented their results and decided upon follow-up actions.

Some similar findings were found in all three countries regarding the capacity of existing organizations to contribute to a discussion of programs and policy, the characteristics of the selected barrios, and the community identification of elements of the quality of life and social dynamics. Rural-urban migration was an important issue in Honduras and Nicaragua, but not in Costa Rica. In each country, the emphasis of the research differed slightly. For example, in Honduras, cultural aspects were given more attention than in the other countries. The project ended with an evaluation of the research experience and with recommendations and suggestions for community-level project based on the research findings. Particular attention was given to the appropriate dissemination of findings at the community-level.

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Project documentation:

P. Canizares, C. Landín, R. Rodriguez, M. Merchan, and S. Chérrez. 1991. Manejo de los Desechos Solidos en Ecuador. Fundación Natura.

The video "A Matter of Habit", produced in Spanish by Fundacion Natura, was dubbed, by IDRC, into French and English. It is available, for educational use, from either Fundacion Natura or IDRC .



CITIES FEEDING PEOPLE PROJECT FACT SHEET 12
International Development Research Centre

Project title: Engineered Wetlands for Urban Water Management
(Battambang, CAMBODIA)

Project category: Reuse of Urban Waste

Research institution: Secretary of State for Environment
IDRC grant: \$ 230 000 CAD

Centre file no.: 94-0012

Duration: 2 years (in progress)

Purpose: The research seeks to determine if the engineered ponds and wetlands system in the city of Battambang (the second largest city in Cambodia) is an effective option for waste water treatment. Engineered ponds and wetlands are technological and less costly alternative to conventional waste treatment.

Objectives: There are three main research objectives: to examine the appropriateness and sustainability of the treatment technology; to build institutional capacity for wastewater management at the provincial and national level; and to make an overall assessment of the treatment system, institutional capacities, social and economic factors as related to the transfer of technology to other urban areas of Cambodia.

Project findings: The Battambang wastewater treatment system was built by the Ministry of Public Works under the supervision of a Dutch consulting firm and with funding from the EC. Unfortunately, no training was provided for staff to run the system. This resulted in some delays which have since been resolved and the system is now operational. This project will research the social and technical aspects of managing this system and will place considerable emphasis on building institutional research capacity. The project has been underway for eight months and water quality tests show that treated water is within WHO recommended values for all water uses except for drinking.

Liaison work between the Ministry of Environment and the Provincial Environment Department has been undertaken as has an examination of the roles, responsibilities and capabilities of a number of government agencies. A team of research assistants have been trained to carry out the social and economic component of the project. Time has also been devoted to understanding local institutional structures and it has been found that a top-down pattern of information flow currently exists. Training workshops were held with Ministry of Environment staff in Phnom Penh, with treatment plant staff, and with research team members. Informal conversations and more formal interviews with 400 people reveal that economic conditions in the Battambang region are worsening. In order for the plant to be self-sustaining, revenue will have to be generated through fish production, user fees and by other means.

12/07/95

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CITIES FEEDING PEOPLE PROJECT FACT SHEET 13

International Development Research Centre

Project title: Urban Agriculture (Dar es Salaam, TANZANIA)

Project category: Urban Food Production & Processing

Research institution: University of Dar es Salaam

IDRC grant: \$ 18 000 CAD

Centre file no.: 90-0123

Duration: 1 year

Purpose: The aim of the project was to understand in greater detail current trends in urban agriculture in Dar es Salaam. Particular emphasis was placed on land use change in open spaces within the built-up areas, tenure problems, and possible policy interventions.

Objectives: The study had the following specific objectives: to determine the amount and distribution of land used for agriculture; to illustrate the relationship between urban agriculture and urban land-use in three wards within Dar es Salaam; to describe the nature of urban agricultural activities in Dar es Salaam and their significance; and to suggest relevant policy interventions which would be supportive of urban agriculture.

Project findings: Urban farmers were found to be from all socio-economic groups. Urban agriculture was not a marginal activity because it plays a key role in urban household survival, supplies food, saves money which can be used for other basic items, and provides employment. Urban farmers in Dar es Salaam include those who are better off and civil servants. These farmers engage in mixed farming and most of the labour is provided by women. Urban agriculture was found to offset some of the effects of declining wages. The status of urban agriculture seems to have been rising, which also gradually increases tolerance of local authorities for the presence of crops and animals. Urban agriculture contributes to between 20-30 percent of household food supply. Forty percent of the cash used to purchase household food comes from self-employment (including agriculture) and revenues from sales of produce are often much greater than regular wages. Although the amount of land in Dar es Salaam available for urban agriculture has declined, the study indicates that urban agriculture intensifies on more central interstitial land and that it expands in peri-urban areas. The study produced an interesting typology of impediments to urban agriculture. These impediments were placed in four categories, namely policy and organizational, ideological, economic and geographical, and urban agglomeration.

Project recommendations: Policies are needed to ensure that the urban poor also benefit from urban agriculture by providing access to land and controlling land speculation. Urban agriculture needs to be planned for and regulated by controlling the number of animals and managing land use. Over-regulation should be avoided. Collaboration is needed between local authorities and urban farmers on water issues, land use and waste management.

13/07/95

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Project literature:

Camillus J. Sawio. 1993. Feeding the Urban Masses? Towards an Understanding of the Dynamics of Urban Agriculture and Land Use Change in Dar es Salaam, Tanzania. Unpublished Ph.D dissertation, Clark University, Worcester, MA.

Camillus J. Sawio. 1994. Who are the farmers of Dar es Salaam? In Egziabher A.G., Lee-Smith D., Maxwell D.G., Memon P.A., Mougeot L.J.A., and Sawio C.J. Cities Feeding People: An Examination of Urban Agriculture in East Africa, pp.25-46. IDRC.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 14

International Development Research Centre

Project title: Integral System for Recycling Organic Waste (MEXICO)
Project category: Reuse of Urban Waste

Research institution: Grupo de Tecnologia Alternativa (GTA)
IDRC grant: \$ 240 00 CAD

Centre file no.: 88-0104
Duration: 2½ years

Purpose: GTA had previously developed a low-cost, effective means of collection and treating wastes called the integrated system for recycling organic wastes (SIRDO). The goal of this project was to measure the impact of SIRDO activities on the technical, economic and social conditions in the community and determine the factors which enhance the self-sustaining capabilities of the SIRDO process.

Objectives: The research sought to identify the conditions which facilitate or impede the adoption, operation, and maintenance of SIRDO technology; to assess the technical and economic performance of existing SIRDO systems; to analyze the impact of the SIRDO-based process on the socio-economic and political development of the community; and to develop a methodology for the promotion, installation, operation and proper maintenance of the system.

Project findings: Pre-existing systems in three different communities were studied. In two of the communities, research results show that the operation of SIRDO had a positive impact on environmental preservation and community health. Various income generating materials were being produced from treated waste. These materials include bio-fertilizers and plastic pellets. Treated water is used for vegetable production (mainly for the tourist sector) and for flower production (for export). The SIRDO projects have generated employment and return rates of 16% a year. Environmental awareness at the community level and separation of wastes at source have greatly increased. Although the SIRDO process is easily accepted and adopted by the private sector, the lack of coordination in the public sector is a hinderance to wider acceptance. Another problem is the lack of credit available to SIRDO users. The cost-benefit analysis of the SIRDO process is favourable but the banks will not lend money to those wanting to start small-enterprises based on treated waste.

The study produced a methodology which can assist groups desiring to launch an integrated process for environmental decontamination. Separation of waste by source was found to be a key element of waste management and needs to be regulated in both the public and private sectors. In order for recycling to be economically sustainable, several types of wastes must be recovered at the same time. The number of users, distances to recycling units, and characteristics of individual urban communities need to be kept in mind as they largely determine the success of waste management programs.

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Project literature:

Josefina Mena and Pedro Rubio Avirde. 1992. Reporte Final - Programa de Investigación IDRC/GTA/SIRDO 1989-92, Grupo Tecnología Alternativa (2 volumes).

Grupo Tecnología Alternativa. n.d. El SIRDO en Mexico 1979-1992.

Grupo Tecnología Alternativa. n.d. Le SIRDO (Système integral de recyclage des déchets organiques) au Mexique 1979-1992.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 15

International Development Research Centre

Project title: Iodine Deficiency Control (Bombay, INDIA)
Project category: Urban Nutrition & Food Security

Research institution: SNDT Women's University
IDRC grant: \$ 38 000 CAD

Centre file no.: 89-0227
Duration: 2 years

Purpose: The goal of the study was to determine the prevalence of iodine deficiency disorders (IDD) in high risk groups (women of reproductive age and adolescents) in the city of Bombay.

Objectives: The project objectives were as follows: to assess the iodine status and the prevalence of IDD among women and adolescents in urban slums in Bombay; to determine iodine intake from different food items, water and salt; to determine patterns of salt consumption; and to investigate the awareness of slum dwellers of iodized salt and their knowledge and perceptions on IDD.

Project findings: Three hundred adolescents, from a slum at Kandivli, were clinically examined and given biochemical test to determine their iodine status. The results indicate a high prevalence of mild and moderate IDD among adolescents in the sample, with girls having higher rates of total goitre and visible goitre rates than boys. Among pre-school children, goitre was more prevalent in boys than in girls. Just over two hundred pre-schoolers were tested. The prevalence of IDD among 479 pregnant women from urban slums in Bombay was 27.3 percent. Urine tests and goitre rates clearly indicated that the women were at risk of hypothyroidism. An investigation of salt consumption showed that 95 percent of the women consumed non-iodized salt, and the majority showed different grades of thyroid enlargement and deficient urinary iodine excretion. A comparative determination of iodine status in the fishing community of Bombay was carried out. Seventy-five families involved in fishing and who consumed fresh or dry fish on a daily basis were surveyed. In spite of an iodine rich diet, there were still high rates of IDD prevalence, particularly of goitre. This suggest that another factor (probably an unknown goitrogen) was inhibiting iodine uptake.

The sources of dietary iodine in 10 different regions of India were investigated. Cereals contribute 32 to 49 percent of dietary iodine. Milk and other dairy products were another important source. Depending on the amount consumed, fresh fruit and vegetables provided between 4 and 27 percent of daily requirements. Salt provided 15 to 42 percent of daily requirements. Iodine losses during cooking ranged from 37 to 70 percent. In seven out of ten regions, the iodine content of cooked mixed diets was below the recommended daily allowance. Consumption of iodized salt was lowest among women of low-income groups as they bought mostly coarse, non-branded salt.

18/07/95

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Project literature:

N.S. Dodd. 1992. Report on iodine deficiency in urban slums in Bombay. SNDT Women's University.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 16

International Development Research Centre

Project title: Informal Sector Street Foods (Pune, INDIA)

Project category: Urban Food Consumption & Distribution

Research institution: Centre of Studies in Social Sciences **Centre file no.:** 87-0053

IDRC grant: \$ 38 000 CAD

Duration: 2 years

Purpose: The aim of this project was to provide information which would serve as a basis for enabling the municipality of Pune, banks, and others to understand and support informal sector street food vending.

Objectives: The general idea was to gather information about current policy, street food vendors, their practices, and their clients and about food quality, nutritional value and hygiene. The expected output for the project was a policy framework for street food vending in Pune.

Project findings: The industrial city of Pune (population of 1.6 million in 1991) did not have a long tradition of street food vending and eating. Therefore, although street food vending was expanding, it involved a relatively small portion of the city's population (less than one percent). The clientele for street foods comprised of both the poor as well as the better off in the city. The majority of vendors operated without licences which restricts access to government services (ex: loans at reduced interest rates). To reduce spoilage and the amount of unsold food, ingredients (even non-perishable ones) were bought and cooked on a daily basis.

In Pune, a lengthy urban experience was needed for the successful running of street food vending enterprises. A large majority of the vendors had done some work in food preparation and catering before starting their own enterprise. Most vendors made reasonable incomes and a few were very successful. For most vendors, it was the only or the primary source of household income. There were relatively few female vendors and many of these made less money than their male counterparts because women often ran their enterprises alone and their work hours were restricted for both domestic and cultural reasons. Women tended to cater to clients with lower incomes and the food they cooked was prepared more hygienically than the food sold by male vendors.

Although there are restrictions on where in Pune street food vendors could sell food, these had not been fully implemented. Market forces largely determine how space is allocated in urban areas of India. Therefore, it remained to be seen whether a proposal to allocate space to food vendors would actually be implemented. Along with legitimizing food selling activities, the provision of vending sites and adequate facilities (for washing, storage of bulk items and food preparation) are recommended.

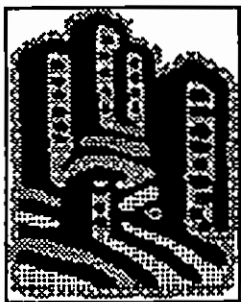
18/07/95

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Project literature:

Meera Bapat. 1992. Street Food Vending in Pune. Centre of Studies in Social Sciences.

Meera Bapat. 1990. Informal Sector Street Food Vendors: A Study in Pune (India). Centre of Studies in Social Sciences.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 17

International Development Research Centre

Project title: Urban Agriculture in Tropical Africa
Project category: Research Support Activity

Consultant: Kando Golhor
IDRC grant: \$ 16 000 CAD

Centre file no.: 94-4056
Duration: 6 months

Purpose: The goal of this consultancy was to help IDRC and previously contacted institutions to elaborate a joint research project on urban agriculture in West and Central Africa.

Objectives: The consultant was to assist IDRC staff in Ottawa and at the West African Regional Office in outlining a strategy for supporting urban agriculture research at the regional level; to investigate current activities in different cities and talk with the actors involved; and to help institutions in the region to formulate a research proposal which focuses on specific constraints to the development of urban agriculture in major cities in the region.

Project findings: A number of institutions in four cities (Niamey, Niger; Ouagadougou, Burkina Faso; Bamako, Mali; and Dakar, Senegal) were visited. Urban agriculture was prevalent in all cities. In Niamey, production of dry season vegetables was very popular, particularly with migrants from other countries. Although there was a large number of local NGOs in Niamey, they did not have a capacity for research. However, three institutions were identified as having such capacity. Ouagadougou has been described as self-sufficient in fruits and vegetables but there is not data to confirm this. There are a number of projects on urban environmental management, particularly in the area of water and sanitation which could serve as a basis for project development in urban agriculture. Since the 1970s, urban cultivation in Bamako has been declining due to the rapid expansion of the city. Nevertheless, this activity is still highly visible in Bamako. In Dakar, two peri-urban farms were visited and production constraints and problems were discussed in connection with urban food supply. A meeting was also held with IDRC staff and representatives of various local institutions. Two such institutions had research projects on urban agriculture and use of waste water.

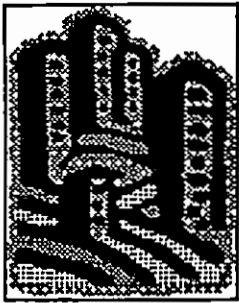
Common constraints identified were the lack of knowledge on how to integrate urban agriculture with waste and water management, the supply of improved seed, access to capital and organic matter), lack of marketing arrangements, and losses during storage. As a result of these visits, three research projects were singled out. The first would be to look at methods for urban organic wastes utilization in urban cultivation. The second is similar but would involve the reuse of waste water. The third would look at the availability and suitability of improved seed to fruit and vegetable production. These three projects could serve as the basis for the development of a research network to which more countries and institutions would be added.

20/07/95

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Project literature:

Kando Golhor. 1995. L'agriculture urbaine en Afrique tropicale: évaluation in situ pour initiative régionale. Cities Feeding People Series Report 14, IDRC.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 18

International Development Research Centre

Project title: Cities Feeding People Panel - Habitat 94

Project category: Research Support Activity

Consultancies: various recipients

IDRC grant: \$ 12 000 CAD

Centre file no.: 94-4040

Duration: 1 month

Purpose: The purpose of this research activity was to support the preparation of four papers for Habitat 94 World Congress Conference in Edmonton (Alberta, Canada) and facilitate the participation of the authors at this conference.

Project findings: The IDRC sponsored panel entitled "Cities Feeding People - Urban Agriculture and City Planning" was held September 20, 1994. The panel discussed and compared the recent evolution of food production within and around cities of the North and South and its significance in terms of land use, practitioners, consumers, share of urban food supply, and market value. Recent changes in official recognition, regulation and promotion of urban agriculture were discussed. In addition to the above, the panel addressed the important challenges for urban agriculture which city planners can assist in overcoming in order to render cities more sustainable.

The four papers produced were:

"Promoting Urban Agriculture: A Strategy Framework for Planners in North America, Europe and Asia" by Paul Sommers, Tropical Horticulture Consultant, and Jac Smit, both of The Urban Agriculture Network, Washington, D.C. USA.

"Urban Agriculture and the Sustainable Dar es Salaam Project, Tanzania" by Camillus Sawio, UNCHS-IDRC Research Project Coordinator, Department of Geography, University of Dar es Salaam, Tanzania.

"Une Histoire des Deux Villes: Comparing Canadian Community Gardening Programs in Montreal and Toronto" by Sean Cosgrove, Design Consultant, Toronto Food Policy Council, Toronto, Canada.

"Urban Agriculture: Can Planners Make a Difference?" by Timothy Greenhow, Urban and Regional Planner, SWEDPLAN - International Division of Sweden's National Board of Housing, Building and Planning, Stockholm, Sweden.

An additional paper by Dr. Luc Mougeot of IDRC was presented at the panel and was entitled "Urban Food Production: Evolution, Official Support and Significance."

All five papers have been revised and are now available from the IDRC.

20/07/95

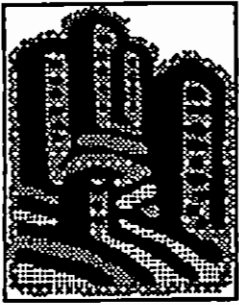
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CITIES FEEDING PEOPLE PROJECT FACT SHEET 19

International Development Research Centre

Project title: By-Products (GHANA)

Project category: Urban Food Production & Processing

Research institution: University of Science & Technology **Centre file no.:** 91-0168

IDRC grant: \$ 200 000 CAD

Duration: 3 years (in progress)

Purpose: The project will develop low-cost feed packages based on locally available crop residues and by-products. The development of such feeds should alleviate the problem of feed quality and availability facing small ruminant producers in villages and urban areas of Ghana.

Objectives: More specifically, the project will seek to identify and estimate the quantity and quality of the most important crop residues and agricultural by-products available; to assess the relative importance of small ruminant production; to formulate and evaluate diets made with crop residues and by-products for use by producers; to document the mode of action of the major cellulolytic microbial organisms in the rumen of sheep fed these diets; and to disseminate the feed packages and associated technology developed by the project.

Project findings: The study was carried out in three districts. Two districts (Savelugu and Bole) were in the Northern Region where there is a large number of small ruminants and serious dry season feed shortages occur. In the third district (Techiman) in the Ashanti region, the dry season was shorter but there were comparatively fewer animals.

Results of the socio-economic survey are available for the Techiman District. Over fifty percent of the households kept livestock. Sheep and goats were commonly found. Most animals were kept either for home consumption or for income derived from sales. The study found a strong correlation between the source of feed (household refuse, cut and carry herbage, or free range grazing of browsing) and the prevalence of disease. The main feed constraints were the lack of foliage available during dry season and lack of money to buy feed or to hire labour to take animals for grazing. To alleviate these constraints, producers grew fodder, used household refuse or saved yam and cassava peels. By-products from maize, rice and several other crops production are already commonly used.

An additional component of the project is well under way. This component comprises of: a diagnostic survey of three households in each of eight suburbs of Kumasi and twelve suburbs of Effiduasi using semi-structured interviews and direct observation, a formal survey in both cities, a determination of the chemical composition of different varieties of cassava and plantain peels from different locations in Kumasi, a feed intake and a digestibility trial, and the measurement of animal growth rate.

8/08/95

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CITIES FEEDING PEOPLE PROJECT FACT SHEET 20

International Development Research Centre

Project title: Resource Allocation Choices in Urban Agriculture (KENYA)

Project category: Research Support Activity

Research Institution: University of Nairobi

IDRC grant: \$ 6 000 CAD

Centre file no.: 94-0015

Duration: 3 months

Purpose: The aim of the project was to gather and analyze information on urban food producers residing in a squatter settlement of Nairobi. The focus of the investigation was the allocation of resources to and from urban food production .

Objectives: The objectives were as follows: to undertake an exploratory study of urban agriculture in Kibera, the largest informal settlement in Nairobi; to examine the role of agriculture as one of several strategies for coping with urban poverty; to provide information on producer decision-making and its practical implications; to suggest ways in which urban agriculture can be supported while minimizing negative effects on less powerful groups.

Project findings: Study results were based on case studies of four food producers, focus group discussions, and interviews with both producers and non-producers. The availability of cash within the household, the value producers place on food for home consumption, the availability of labour and the risks associated with insecure land tenure, theft and land degradation were the factors which most influenced the practices of urban food producers.

The producers in Kibera generally had their plots in a large open space near the settlement. Most of the land was recently privatized thereby worsening an already insecure tenure situation. There were substantial differences between the best-off and worst-off producer households. Regular employment of one or more household members outside of agriculture was a key determinant of economic status. Aside from occasional surpluses which were sold, given as gifts or sent to relatives, most produce was kept for home consumption. Food production by Kibera residents was a risky endeavour. Theft of crops and animals was common. A growing number of producers were being evicted without prior notice or any form of compensation. Producers therefore had little incentive to invest resources in soil conservation. The social networks of producers were invaluable in helping new producers get started. These networks helped with obtaining inputs and accessing land. There were very few community-based producer organizations. These were usually involved in guarding crops against theft at night or in trying to obtain compensation when eviction occurred.

Project recommendations: Urgent action is needed regarding municipal land use and tenure arrangements. NGOs and other organizations could play much needed a liaison role between producers, the municipal government and the national government to support food production activities in informal settlements and in Nairobi as a whole.

16/08/95

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Project literature:

P.R. Dennery. 1995. Inside Urban Agriculture: An Exploration of Food Producer Decision Making in a Nairobi Slum. M.Sc. thesis, Dept. of Ecological Agriculture, Wageningen Agricultural University, Wageningen, The Netherlands.

P.R. Dennery. In progress. Urban food producer decision making. African Urban Quarterly.

P.R. Dennery. 1994. Martha is a city farmer. ILEIA Newsletter, December 1994, Vol. 10, No. 4, p.7.



CITIES FEEDING PEOPLE PROJECT FACT SHEET 21

International Development Research Centre

Project title: Land Restoration Through Waste Management (INDIA)
Project category: Reuse of Urban Waste

Research institutions: see below*
IDRC grant: \$ 97 000 CAD

Centre file no.: 93-1003
Duration: 1½ years

Purpose: The goal of this project was to evaluate the cost efficiency and the practicality of collecting, transporting, and applying mixtures of fly ash and sewage sludge to restore degraded lands. Because disposal of fly ash and sewage sludge are major waste management problems in India, the project tried to tackle both problems at the same time.

Objectives: The objectives were as follows: to identify organizations which can link rural areas to suppliers of fly ash or sludge; to assess the cost and practicality of transporting these wastes to degraded areas; to determine the best methods of mixing and application; and to monitor and compare the cost of using ash and sludge versus using imported chemical fertilizer.

Project findings: Non-edible trees and grasses were planted at two sites with 1:1 and 3:1 sewage sludge and ash mixtures being applied. Growth measurements were taken and compared with those of soil-only controls. Two additional trials were run at the second site: a weed (water hyacinth) was added to the ash sludge mixture and a commercial fertilizer was used with soil alone. The sewage sludge and fly ash mixtures were found to increase biomass yields by several hundred percent. These mixtures produced a good soil amendment as they contains both plant nutrients and organic matter.

The cost of collection of waste materials by hand, transportation by truck, and mixing using a cement mixer was Rs. 2 per kg, bringing the total cost of ash and sludge mixture application per tree to between Rs. 100-150 for a small-scale operation. These costs could be offset by the cost savings for waste disposal and the benefits from increased productivity. Piping the mixture over a distance of 70 kms was tried. The cost per tonne was between Rs. 1.78/km and Rs. 2.24/km depending on the size of the pipe. The cost would be lower with a shorter distance. Three potential users or supporters of this technology were identified: village people, waste producers (power plants and municipalities) and industries (mainly pulp and paper). They would benefit from cost savings or from revenue generation. The uptake of heavy metals by the plants in the trial was relatively small. The application of sludge and ash mixtures did result in a change in the composition of trace elements but more research is needed to ensure that trace elements remain below toxic levels.

*University of Western Ontario and Orissa State Prevention and Control of Pollution Board

20/09/95

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Project Literature:

Dr. S. Tripathy, Dr. M.A. Powell and Prof. W.S. Fyfe. 1995. Final Technical Report for the Project "Land Restoration Through Waste Management in India". Submitted to IDRC.

Regional Research Laboratory. 1995. Transportation of Sewage Sludge-Fly Ash Mixture Slurry. Supplementary Report for Land Restoration through Waste Management. Regional Research Laboratory (Council of Scientific & Industrial Research), Bhubaneswar-751-013, India.

CITIES FEEDING PEOPLE PROJECT FACT SHEET 22

International Development Research Centre



Project title: Workshop on Latin American Research Initiative
on Urban Agriculture

Project category: Research Support Activity

Research institution: see below*

IDRC grant: \$ 36 800 CAD

Other Donors: FAO Rome, FAO Latin American
Region, Swiss Cooperation and Dutch Cooperation

Centre file no.: 94-4020

Duration: 3 months

Non-IDRC funds: \$19 000 USD

Purpose: This workshop was held to launch a regional research initiative on urban agriculture. This project was preceded by preliminary and in-depth assessments of institutional capacities and research opportunities in Latin America.

Objectives: The project objectives were as follows: to share work experiences in areas of common interest; to define priorities for action and identify needs for research, training, funding, sharing know-how, publication, and dissemination; to reach agreement on a three year work plan; to formalize the operation of the regional research network known as Agricultura Urbana Investigaciones Latin America (AGUILA).

Project findings: The workshop brought together representatives from 40 institutions from Argentina, Bolivia, Brazil, Chile, Columbia, Cuba, the Dominican Republic, Ecuador, Mexico, Nicaragua, Paraguay, and Peru. Eight papers were presented showing a wealth of research experiences and the major constraints to the progress of urban agriculture in the region. Working groups on popular hydroponics, production of high-value foodstuffs, small animal husbandry, and reuse of liquid and solid organic wastes were created. A board was elected to give direction to the network. The board members include an Executive Secretary and a representative for each of the following areas: Central America and the Caribbean, the Andes, and the Southern Cone.

The AGUILA network will cooperate to promote favourable conditions for urban agriculture with the aim of improving the food security and the nutritional diversity of low-income groups. Furthermore, activities will seek to have a favorable influence on income generation, alternative economies, sustainable use of resources, and community management. Current and proposed activities by network members include: research on food production on public land which includes waste reuse (Dominican Republic); feasibility and marketing studies on hydroponics (regional); a bibliographic database on urban agriculture (regional); research on urban wastewater treatment and its usefulness for irrigation and aquaculture (Bolivia-Peru); developing of a computerized training course on urban agriculture; and creating a network directory and magazine.

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Project documentation:

Germán Bustos and Mireya Solano. 1995. La diversidad de la vida en una Bogotá sustentable: Mujeres y agricultura urbana. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Beatriz Canabal Cristiani. 1995. La chinampera actual en el Valle de Mexico. Xochimilco: sementera de flores. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Luis Carvajal, 1995. La experiencia de la hidroponía popular en la República dominicana. Proyecto Hidro-USAD. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Lilia Chauca de Zaldívar. 1995. Agricultura urbana: crianza de cuyes. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Alejandro Fuentes, Alexandra Moncada and David Reyes. 1995. Una propuesta de recuperación del espacio urbano. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Pedro Juan del Rosario. 1995. El problema de la basura y alternativas desde la pobreza en la ciudad de Santiago de los Caballeros. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

César Marulanda Tabares I.A. 1995. Propuesta de una estrategia para la difusión sostenible de la hidroponía popular. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Julio Moscoso. 1995. El uso de efluentes de lagunas de estabilización en acuicultura y agricultura. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Albina Ruiz Rios. 1995. Planta fértil y microempresas recolectoras de basura, en el Cono Norte de Lima metropolitana. Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

Ximena Santacruz. 1995. Evaluación de experiencias de agricultura urbana (Ecuador). Paper delivered at Latin American Seminar on Urban Agriculture (IDRC/FAO/AIPE), La Paz, April 1995.

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